

Application No.: 10/619408

Docket No.: STW-063

REMARKS

Applicants amend claims 1-2 and 4-11, cancel claim 3, and add new claims 12-13. No new matter is added. Upon entry of this amendment, claims 1-2, 3-13 are pending, of which claims 1 and 4 are independent. Applicants note that the Examiner did not examine claims 4-11 which were presented in a Preliminary Amendment filed on July 15, 2003. Applicants respectfully request the Examiner to examine all the pending claims. Applicants respectfully submit that all the pending claims define over the art of record.

Rejection of Claims Under 35 U.S.C. §102

Claims 1-3 are rejected under 35 U.S.C. §102(e) as being anticipated by United States Patent Publication No. 2002/0162694 to Iwasaki (hereafter "Iwasaki"). Applicants respectfully submit that Iwasaki does not teach each and every element of independent claims 1 and 4, as amended.

The Claimed Invention

Independent claims 1 and 4 are amended to clarify the claimed invention. Support for the claimed amendment may be found throughout the application and at least at page 6, lines 3-6, and page 7, lines 2-7. Dependent claims 2, 5-11 are amended to yield proper antecedent basis in view of the amendments in the independent claims.

Independent claims 1 and 4 require the limitation of determining whether the fuel cell vehicle is in a predetermined idle mode/state, where the determination is based on at least one of the speed of the fuel cell vehicle being lower than a predetermined value, the expected power consumption of the driving motor being lower than a predetermined value, and the electrical power load being lower than a predetermined value.

Furthermore, the idle control system of the claimed invention changes an operation of the fuel cell according to the *driving mode of the vehicle*. As claimed in claim 1, there are three different driving modes (power generation modes):

Application No.: 10/619408

Docket No.: STW-063

- (i) When the fuel cell vehicle is in a normal driving mode, and not in an idle mode, the idle control system drives the fuel cell to generate electrical power based on electric current corresponding to a required electrical power for driving the driving motor and the auxiliary equipment, and a power storage device assists power generation of the fuel cell by supplying electrical power stored therein to the driving motor and the vehicle auxiliary equipment.
- (ii) When the fuel cell is in a predetermined idle mode, the idle control system stops the fuel cell to stop power generation of the fuel cell by stopping the air compressor. The predetermined idle mode is determined by an idle stop determination device. The determination is based on at least one of determination of whether the speed of the fuel cell vehicle is lower than a predetermined value, determination whether the expected power consumption of the driving motor is lower than a predetermined value, and determination whether electrical power load of the driving motor and/or the vehicle auxiliary equipment is lower than a predetermined value.
- (iii) While the fuel cell is in the predetermined idle mode and it is determined that the state of charge of the power storage device falls below a predetermined state of charge of the power storage device, the idle control system drives the fuel cell to generate a current corresponding to the optimum power generation efficiency of the fuel cell.

Therefore, the driving motor and the vehicle auxiliary equipment are mainly driven by electrical power supplied from the fuel cell, and a power supplied from the power storage device is used only for assisting electrical power generation of the fuel cell. One advantage of the claimed invention is that fuel consumption efficiency can be improved in the idle state operation by stopping the power generation of the fuel cell. Additionally, since the idle control system drives the fuel cell to generate a current corresponding to the optimum power generation efficiency of the fuel cell, the power storage device can be quickly charged.

Application No.: 10/619408

Docket No.: SIW-063

The Iwasaki Reference

The Iwasaki reference illustrates in Fig. 2 a flowchart for controlling a fuel cell power system 100. As explained in paragraphs 30-40, the operation of fuel cell power system 100 depends on the current state of charge (SOC) of a battery 7. The operation of the fuel cell power system 100 can be summarized in the following three steps:

- (i) When the SOC is higher than the upper limit (SOC\_H), the fuel cell power system 100 is held in the idle operation or the stopped condition.
- (ii) When the SOC becomes lower than SOC\_H, the idle operation or the stopped condition of the fuel cell power system 100 is continued.
- (iii) When the SOC becomes lower than the lower limit (SOC\_L), the fuel cell power system 100 is operated such that the fuel cell 7 is charged until the SOC becomes higher than the SOC\_H.

Therefore, the fuel cell power system 100 of the Iwasaki reference changes its own operation depending on the current state of electrical charge, and not the driving mode of the vehicle.

Furthermore, the Iwasaki reference does not disclose the limitation of *determining whether the fuel cell vehicle is in a predetermined idle mode/state*, where the determination is based on at least one of the speed of the fuel cell vehicle being lower than a predetermined value, the expected power consumption of the driving motor being lower than a predetermined value, and the *electrical power load being lower than a predetermined value*.

Nowhere does the Iwasaki reference disclose that an idle state is determined by at least one of the speed of the fuel cell vehicle being lower than a predetermined value, the expected power consumption of the driving motor being lower than a predetermined value, and the electrical power load being lower than a predetermined value, as recited in claims 1 and 4.

Furthermore, the Iwasaki reference discloses a controller that operates the fuel cell power system under a constant load regardless of the electrical load demand, when the electrical load

Application No.: 10/619408

Docket No.: STW-063

demand is smaller than a predetermined load and the controller only operates according to the electrical load demand when the electrical load demand is larger than the predetermined load. See paragraph 7. Additionally, the Iwasaki reference further discloses that when the load range is between the minimum load operation (identical or slightly less than the maximum efficiency operating point) of the fuel cell power system 100 and idle operation or stop, the fuel cell power system 100 does not need to correspond. See paragraph 45. In other words, the fuel cell power system would operate at a constant load when the electrical load demand is lower than the minimum load operation, regardless if it is under idle operation or stop. Therefore, the Iwasaki reference does not teach or suggest determining an idle state by determining the electrical power load being lower than a predetermined value.

Additionally, since the Iwasaki reference discloses that the fuel cell power system would operate at a constant load when the electrical load is lower than the minimum load operation, the Iwasaki reference cannot teach or suggest the limitation that when the fuel cell vehicle is in the predetermined idle mode, the idle control system *stops* the fuel cell to stop power generation of the fuel cell, as required by independent claim 1.

Accordingly, Applicants respectfully submit that the Iwasaki reference does not disclose each and every element and limitation required by independent claims 1 and 4. Applicants respectfully request that the Examiner reconsider and withdraw the rejection to claim 1.

Applicants note that the dependent claims also recite separate patentable subject matter. As such, for this and the reasons set forth above, Applicants respectfully submit that the dependent claims also define over the art of record.

#### New Claims

New claims 12-13, which depend on claim 1, are presented for examination. Support for the new claims may be found throughout the application and at least at Fig. 3 and page 9, lines 13-22. No new matter is added. Applicants note that the new claims recite separate patentable subject matter. As such, for this and the reasons set forth above, claims 12-13 define over the art of record.

Application No.: 10/619408

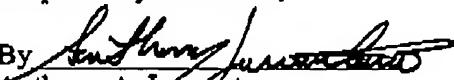
Docket No.: SIW-063

In view of the above amendment, Applicants believe the pending application is in condition for allowance.

Applicants believe no fee is due with this statement. However, if a fee is due, please charge our Deposit Account No. 12-0080, under Order No. SIW-063 from which the undersigned is authorized to draw.

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Respectfully submitted,

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